

## Department of Energy

## § 431.136

### § 431.134 Uniform test methods for the measurement of energy and water consumption of automatic commercial ice makers.

(a) *Scope.* This section provides the test procedures for measuring, pursuant to EPCA, the energy use in kilowatt hours per 100 pounds of ice (kWh/100 lb ice) and the condenser water use in gallons per 100 pounds of ice (gal/100 lb ice) of automatic commercial ice makers with capacities between 50 and 4,000 pounds of ice per 24 hours.

(b) *Testing and Calculations.* Measure the energy use and the condenser water use of each covered product by conducting the test procedures set forth in AHRI 810, section 3, “Definitions,” section 4, “Test Requirements,” and section 5, “Rating Requirements” (incorporated by reference, see § 431.133). Where AHRI 810 references “ASHRAE

Standard 29,” ANSI/ASHRAE Standard 29–2009 (incorporated by reference, see § 431.133) shall be used. All references to cube type ice makers in AHRI 810 apply to all batch type automatic commercial ice makers.

(1) For batch type automatic commercial ice makers, the energy use and condenser water use will be reported as measured in this paragraph (b), including the energy and water consumption, as applicable, of the ice-making mechanism, the compressor, and the condenser or condensing unit.

(2)(i) For continuous type automatic commercial ice makers, determine the energy use and condenser water use by multiplying the energy consumption or condenser water use as measured in this paragraph (b) by the ice hardness adjustment factor, determined using the following equation:

$$\text{Ice Hardness Adjustment Factor} = \left[ \frac{144 \text{ Btu/lb} + 38 \text{ Btu/lb}}{144 \text{ Btu/lb} \times (\text{Ice Hardness Factor}/100) + 38 \text{ Btu/lb}} \right]$$

(ii) Determine the ice hardness factor by following the procedure specified in the “Procedure for Determining Ice Quality” in section A.3 of normative annex A of ANSI/ASHRAE 29 (incorporated by reference, see § 431.133), except that the test shall be conducted at an ambient air temperature of 70 °F ±1 °F, with an initial water temperature of 90 °F ±1 °F, and weights shall be accurate to within ±2 percent of the quantity measured. The ice hardness factor is equivalent to the corrected net cooling effect per pound of ice, line 19 in ANSI/ASHRAE 29 Table A1, where the calorimeter constant used in line 18

shall be that determined in section A2 using seasoned, block ice.

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## ENERGY CONSERVATION STANDARDS

### § 431.136 Energy conservation standards and their effective dates.

Each automatic commercial ice maker that produces cube type ice with capacities between 50 and 2500 pounds per 24-hour period when tested according to the test standard established in accordance with section 343 of EPCA (42 U.S.C. 6314) and is manufactured on or after January 1, 2010, shall meet the following standard levels:

Equipment type	Type of cooling	Harvest rate (lbs ice/24 hours)	Maximum energy use (kWh/100 lbs ice)	Maximum condenser water use * (gal/100 lbs ice)
Ice Making Head .....	Water ...	<500 .....	7.80–0.0055H .....	200–0.022H.
Ice Making Head .....	Water ...	≥500 and <1436 ..	5.58–0.0011H .....	200–0.022H.
Ice Making Head .....	Water ...	≥1436 .....	4.0 .....	200–0.022H.
Ice Making Head .....	Air .....	<450 .....	10.26–0.0086H ...	Not applicable.
Ice Making Head .....	Air .....	≥450 .....	6.89–0.0011H .....	Not applicable.
Remote Condensing (but not remote compressor) ...	Air .....	<1000 .....	8.85–0.0038H .....	Not applicable.
Remote Condensing (but not remote compressor) ...	Air .....	≥1000 .....	5.1 .....	Not applicable.
Remote Condensing and Remote Compressor .....	Air .....	<934 .....	8.85–0.0038H .....	Not applicable.
Remote Condensing and Remote Compressor .....	Air .....	≥934 .....	5.3 .....	Not applicable.
Self Contained .....	Water ...	<200 .....	11.40–0.019H ...	191–0.0315H.